

The TES bolometric instrument of LSPE

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Detecting B-mode polarization at large angular scales of the Cosmic Microwave Background (CMB) is one of the main challenges in modern observational Cosmology. Superconducting TES Bolometers are a suitable detector choice to meet the $10 \text{ aW/Hz}^{0.5}$ NEP requirement.

We present the development status of large area spider-web bolometers and SQUID FDM readout instrument for the LSPE-SWIPE balloon borne telescope. The bolometers have a 10 mm diameter Si_3N_4 membrane with a mesh size of $250 \mu\text{m}$ suspended with a thin leg structure. The TES sensor is a Ti/Au bilayer with T_c tuned in the 500-550 mK range, thermally coupled to a Bi/Au microwave absorber. About 330 bolometers will be biased at constant voltage and readout SQUID current amplifiers with low noise front-end JFET amplifier. A dedicated 16-channel Frequency Domain Multiplexing readout electronics provide a comb of MHz carrier frequencies. Signal demodulation, on board signal digitization and pre-analysis and overall control of the bolometric instrument will be performed by the FPGA acquisition board.

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